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# The Ultimate Challenge: Prove B. F. Skinner Wrong

Paul Chance

For much of his career, B. F. Skinner displayed the optimism that is often attributed to behaviorists. With time, however, he became less and less sanguine about the power of behavior science to solve the major problems facing humanity. Near the end of his life he concluded that a fair consideration of principles revealed by the scientific analysis of behavior leads to pessimism about our species. In this article I discuss the case for Skinner's pessimism and suggest that the ultimate challenge for behavior analysts today is to prove Skinner wrong.

*Key words:* challenge, evolution, extinction, pessimism, pollution, B. F. Skinner

The wag has it that "There is no future in pessimism." Certainly thinking well of the future is more pleasant than thinking ill of it, because the future is where we all end up. When approaching old age, for example, it is more pleasant to tell ourselves that "the best is yet to be" than to contemplate urinary incontinence, deafness, and life without memory. We all become masters of self-delusion when self-delusion pays better wages than realism, as it so often does.

B. F. Skinner, it seems, deluded himself for years about the power of behavior science to improve the future of humanity. In the early days of his career, he was quite the optimist. In 1945, Skinner (1948b) spent a summer writing *Walden Two*, a novel describing a utopian community based on behavioral principles. In *Science and Human Behavior* he wrote, "The methods of science have been enormously successful wherever they have been tried. Let us then apply them to human affairs" (1953/1965, p. 5). In a 1967 magazine interview, Skinner spoke of using behavior science "in designing a world that will make us into the kind of people we would like to be and give us the things that we could all agree that we want" (M. H. Hall, 1967, in Chance & Harris, 1990, p. 5). In *Beyond Freedom and Dignity* he wrote, "Our culture has produced the science and technology it needs to save itself" (1971, p. 181), and he ended the book with these lines: "A scientific view of man offers exciting possibilities. We have not yet seen what man can make of man" (p. 215). Not long after this, Skinner remarked, "I'm an optimist. I think we have only to understand ourselves to reach a golden age" (E. Hall, 1972, p. 65).

But although Skinner was optimistic, he knew there were formidable impediments to reaching a golden age. Over the years, Skinner seemed to feel more and more that those impediments tipped the scales against us. The major difficulties were not technical. We already had the technology to improve education dramatically, for example, and to reduce markedly pollution and the consumption of natural resources. Rather, the difficulty stemmed mainly from certain behavioral propensities that are part of our evolutionary heritage. In 1982, Skinner wrote that although we may be able to predict certain events,

> the future of the species may depend upon whether there can ever be any contingencies of reinforcement, contrived or natural, that will induce us to act upon those predictions. We may "know" that certain things are going to happen, but knowing is not enough; action is needed. Why should it occur? That is perhaps the most terrifying question in the history of the human species. (p. 8)

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Address correspondence to Paul Chance, 9590 Cedar Lane, Seaford, Delaware 19973 (e-mail: paulchance@verizon.net).

In a talk at the American Psychological Association in 1982, Skinner attempted to explain "why we are not acting to save the world" (published in Skinner, 1987). His answer focused on evolved propensities, such as our liking for sugar, salt, and sex, that work against us in our present environment. Yet even then he argued that "we have the science needed to design a world that would take that nature into account and correct many of the miscarriages of evolution" (p. 11).

By the end of the 1980s, however, Skinner's optimism had vanished. I discovered this when I called him concerning an anthology I was then editing (Chance & Harris, 1990). Skinner's 1967 interview was to appear in the book, and I asked him whether his views had changed since then. They had indeed, he said. "I used to believe that a science of behavior could show us how to solve the problems confronting us—pollution, overpopulation, poverty, the threat of nuclear war. But I am forced to conclude that what the science of behavior shows us is that we *can't* solve these problems" (private conversation, 1989; reported in Chance & Harris, 1990, p. 10). He added, "I'd say that was a pretty significant change in my views, wouldn't you?" Stunned, I had to agree. I asked if he had expressed this opinion publicly before then. He replied that he had said as much in a new preface to one of his books, but deleted the comment after someone objected that it would be too demoralizing.[1]

[1] Presumably the book in question was *Beyond Freedom and Dignity*, which was published by Penguin with a new preface in 1988. Although Skinner evidently temporized his position on the ability of behavior science to save humanity, hints of his pessimism remain. For example, he writes, "When I wrote this book I *thought* [italics added] that we could correct for the weakness of remote consequences simply by creating current surrogates to serve in their place" (1988, reprinted in Skinner, 1989, p. 118).

Some might dismiss Skinner's change of heart as a reaction to old age and the frailty that comes with it. Skinner was well over 80 at the time of our conversation and would die of leukemia about a year later. But as we chatted he seemed energetic and well, and I detected no sign of depression. On the contrary, he was quite cheerful and chuckled a bit at his surprising revelation. Whether what amused him was his own transformation or my surprise at hearing it, I cannot say.

There seems no reason to believe the shift in Skinner's thinking was the result of age, illness, or depression. Rather, it appears to have been a conclusion arrived at gradually and reluctantly after many years of thought and study. Unfortunately, it is all too easy to list the kinds of findings from behavior science that might have led Skinner to pessimism:

*Immediate consequences outweigh delayed consequences* (Grice, 1948; Hineline, 1977; Hull, 1943; Mischel & Grusec, 1967; Navarick, 2004; Perone, 2003). As Rachlin (2000) points out, the alcoholic wants to wake up sober in the morning, but right now he wants a drink. In the same way, John Q. Citizen wants his children to live in a world with clean air, but right now he wants to drive his air-polluting SUV. Many members of Congress want to have laws one day that make it illegal for anyone to manufacture, sell, or drive a vehicle that gets only 10 miles to the gallon of gasoline, but today they want to meet with the lobbyist for one of the major car makers or oil companies. Skinner (e.g., 1986) pointed out that it is possible to deal with delayed consequences by arranging mediating events, but the benefits for doing so are apt to be delayed. Advice and rules are often offered to encourage people to behave in ways that are in their long-term interests, but unless the immediate consequences for doing so are positive the advice is often ignored. As Skinner

(1982, published in 1987) observed, "The advice we are now being offered is about a distant future; it may be good advice, but that has very little to do with whether we shall take it" (p. 5).

*Consequences for the individual usually outweigh consequences for others.* Researchers debate whether true altruism, in which one individual helps another without personal gain, exists (Cialdini, Brown, Lewis, Luce, & Neuberg, 1997; Sober & Wilson, 1999; Staub, 2003). Even if it does, it seems clear that most of the time we look out for number one. In principle, everyone abhors the political pork that builds bridges to nowhere. Yet few people write letters to their congressman complaining about the use of federal tax dollars to build a presidential library or other tourist attraction in their state. We all agree that making sacrifices for the common good is a virtue, but it's a virtue we like to see practiced by others more than by ourselves.

*Coincidental events often strengthen ineffective behavior* (Ono, 1987; Skinner, 1948a; Vyse, 2000; Wagner & Morris, 1987). Events that are in no way causally related to the behavior they follow often affect that behavior as if they were. One result is that many people reject proven medications in favor of unproven herbs, attach good luck charms to their dashboards while failing to use seat belts, and deal with the Palestinian problem, if at all, by praying for peace.

*Some chemicals are destructively reinforcing.* Skinner (e.g., 1987) often noted that the reinforcing power of sugar and salt, which were usually in short supply during humanity's hunter-gatherer days, now threaten our health. But our fondness for sugar and salt is just the beginning. Alcohol, nicotine, opium, cocaine, methamphetamine, and many other chemicals are powerfully reinforcing for many people and have a huge negative impact on productivity worldwide, to say nothing of the tragic consequences they have for health and human welfare (United Nations Office on Drugs and Crime, 2007; von Zielbauer, 2007).

*Simple, familiar ideas that are wrong are often preferred over complex, alien ideas that are correct* (Kaiser, McCloskey, & Proffitt, 1986; McCloskey, Washburn, & Felch, 1983). Students learn in school that day follows night because the earth rotates on its axis, but many later revert to the more intuitive idea that the sun orbits the earth every 24 hours (Sadler, 1992). Reams of data suggest that most behavior can be explained entirely in terms of biology, learning history, and the current situation, but even many psychologists prefer explanations based primarily on a mysterious and willful mind. Skinner himself was often the victim of the tendency of people to twist statements into simpler, more familiar, but inaccurate forms (Morris, Lazo, & Smith, 2004; Morris, Smith, & Lazo, 2005; Palmer, 2006; Todd & Morris, 1992).

*Susceptibility to social reinforcement can incline us toward extreme views* (Fraser, 1971; Janis, 1982; Kaplan & Miller, 1983; Verplanck, 1955). Ku Klux Klan members do not ordinarily associate with members of the American Civil Liberties Union. We like hearing people say that they agree with us and tend to avoid the company of those who don't. Without the tempering influence of contrary opinions, some of us spiral toward ever more radical views. The people who carried out the murder-suicide attacks against the United States on September 11, 2001, for example, were not poor, uneducated, downtrodden people with nothing to lose; they were mostly well-educated, middle-class people with families who, unfortunately, spent a lot of time interacting with others who shared their fundamentalist religious beliefs. Some people thought that the Internet would reduce extremism by exposing people to many different

opinions. Instead, it may increase extremism. Through it, people with radical beliefs can readily find others with similar opinions and, through mutual social reinforcement, gravitate toward even more extreme views.

*In the absence of countercontrol, the use of aversives tends to be very reinforcing to those who use them* (Conroy, 2000; Haney, Banks, & Zimbardo, 1973; Sidman, 1989). The abuses at Abu Ghraib Prison in Iraq revealed nothing new about the capacity of ordinary people for cruelty (Higham & Stephens, 2004). Some people attempted to explain those abuses by attributing them to character flaws in the individuals involved, saying, ''There are a few rotten apples in every barrel.'' But social psychologist Philip Zimbardo (2007) replied that it was not the apples that were rotten, but the barrel itself. Put people in a situation in which they are free to abuse others without paying a price, and they are likely to do so.

*Strong aversives presented abruptly prompt appropriate action, but strong aversives following a long string of aversives that gradually increase in strength often do not* (Masserman, 1946; Miller, 1960; Scripture, 1895, reported in Perone, 2003). This suggests that as long as conditions worsen gradually, we will tolerate bad air, foul water, loud noise, psychological and physical abuse, and crime that would once have been considered intolerable. ''Oh,'' we say, ''you get used to it.'' And that is precisely the problem.

*Nearly all people believe in supernatural forces and identities* (Bloom, 2005; Harris, 2006). Our inclination to believe in devils, angels, ghosts, miracles, and other mystical ideas works against a rational, scientific approach to problems. For example, many Americans believe that the AIDS pandemic, fighting in the Middle East, and environmental degradation do not signal the need for rational analysis and changed behavior. Rather, they are signs that biblical prophecies of the world's end are about to be fulfilled. Similarly, people who see the face of the devil in smoke emanating from a World Trade Center tower are not likely to understand, much less support, a scientific approach to terrorism.

Had Skinner composed this list (which is by no means exhaustive), it would no doubt be somewhat different, but it has to be admitted that many of the things that science has revealed about behavior raise doubts about our ability to solve the complex problems that confront us. It seems that Skinner had good reason to be pessimistic about humanity's future.

Optimists may reply that if we are not dealing effectively with our greatest problems, it is because it takes time for new ideas, such as the scientific analysis of behavior, to take hold. We must be patient, the optimists argue, and they point to Darwin for support. It took many decades for Darwin's ideas to win acceptance, but now virtually all biologists, the vast majority of other scientists, and in some countries a majority of laypeople, accept evolutionary theory. ''Give us time,'' the optimist says, ''give us time.''

The trouble, Skinner might counter, is that *we don't have time*.[2] The fact that it has taken nearly 150 years to win over fewer than half the American people to the idea of evolution is an argument for pessimism, not optimism. It suggests that it may well be another hundred years before even a large minority of adults

[2] British physicist Stephen Hawking would probably agree. He urges the establishment of colonies on other celestial bodies. ''Life on earth,'' he explains, ''is at the ever-increasing risk of being wiped out by a disaster, such as sudden global nuclear war, a genetically engineered virus or other dangers we have not yet thought of'' (quoted in Overbye, 2007, p. A14).

will accept the idea that a technology exists for changing behavior. Meanwhile:

Earth's temperature is increasing, glaciers are melting, and sea levels are rising (Intergovernmental Panel on Climate Change, 2007). Within 20 years the homes of tens of millions of people are likely to be flooded, hundreds of millions of people will be without sufficient drinking water, and tropical diseases such as malaria will spread (Kolbert, 2006; "Top Scientists Warn," 2007). Although vigorous efforts now could prevent some of this damage, some climatologists believe it is already too late to avoid all of it ("Top Scientists Warn").

Natural resources are diminishing while the competition for them is increasing. Wilson (2002) speaks of "a bottleneck of overpopulation and wasteful consumption" (p. xxiii). Wilson adds that "for the rest of the world to reach United States levels of consumption with existing technology would require four more planet earths" (p. 150).

Species are becoming extinct at an astonishing rate—perhaps 100 times greater than before human influence (Wilson, 2002). Some experts believe that up to one million species will be extinct or doomed to extinction by 2050 (Pounds & Puschendorf, 2004). The extinction of so many species may increase our own chances of extinction. For example, many plants have medicinal value; some animals are important to agriculture; the extinction of one species can result in an economically devastating increase or decrease in another.

Species that evolved in one environment are now invading others, where they pose various kinds of threats to our survival. Today at least 5,000 alien species make their homes in the United States (Devine, 1999). Bilge water pumped from foreign vessels is just one important source of transplanted life forms (Sax, Stachowicz, & Gaines, 2005).

Devastating epidemics are a virtual certainty. Epidemiologists say that a flu pandemic like the one that killed 40 million worldwide in 1917–1918 is overdue. Conditions in many parts of the world—contaminated water, untreated sewage, war, shared needles, prostitution, interaction of humans and wild animals, overuse of antibiotics—are ripe for widespread bacterial and viral diseases (Garrett, 1995).

The rate of human population growth, while slowing, is still exponential. The world's population reached 1 billion in 1800, exceeded 1.5 billion by 1900, now stands at over 6 billion, and is expected to exceed 9 billion by 2050 (United Nations Population Division, 2007). Advances in biomedicine threaten to make matters worse by extending average life expectancy, at least in the more affluent countries (Mann, 2006). The biomass of human life is already as much as 100 times the biomass of any large land animal that has ever lived, and continued growth cannot be sustained (Wilson, 2002).

Terrorist acts have become commonplace in some parts of the world and may become the norm on every continent. Advances in technology have resulted in weapons of great power, some of which can be constructed with readily available materials following instructions available on the Internet. It seems inevitable that the tit-for-tat pattern of violence we have seen in Iraq and elsewhere will include nuclear weapons or other means of mass destruction.

Ignorance is rampant throughout much of the world. Millions of people can neither read nor write, believe that diseases are caused by witches or evil spirits, and think natural disasters are God's punishment for collective sins.

It is true that not all the news is bad, that there have been some successes. Smallpox and polio have been effectively eradicated. Thanks in part to behavior analysts, many victims of

severe childhood disabilities such as autism can lead much more fulfilling lives (Lovaas, 1987; Smith, 1999); people suffering from certain debilitating behavior disorders (e.g., obsessions, phobias, depression) are able to get relief from their symptoms (Kazdin, 2000; Wolpe, 1992); many businesses have discovered that they can treat their employees well and still prosper (Daniels, 1999; Fox, Hopkins, & Anger, 1987; "New Tool," 1971); there are schools here and there in which students are learning a great deal and enjoying the school day (Johnson & Layng, 1992); and animals are trained and maintained more effectively and humanely than in the past (Markowitz, 1982; Pryor, 1999). *Positive reinforcement* is a phrase that is now familiar to (if not well understood by) many parents, teachers, and corporate managers. Governments now sometimes reward desirable behavior, such as working, rather than undesirable behavior, such as collecting welfare checks (e.g., the Welfare Reform Bill of 1996). And many organizations are striving to fight hunger, poverty, pollution, habitat destruction, species extinction, and disease (e.g., Habitat for Humanity, Doctors without Borders, Greenpeace, the Nature Conservancy, the Peace Corps, Population Connection, UNICEF). Surely Skinner would admit that these are grounds for optimism.

Skinner was undoubtedly aware of these achievements, yet they did not deter him from pessimism. It seems likely that his reply to this challenge would have gone something like this: These developments are admirable, but the effort falls far short of what is needed to avert catastrophe and far short of what could be accomplished if the full power of science, including behavior science, were brought to bear. We are simply not attacking the major problems that confront humanity in the most effective ways. Where serious threats to humanity are concerned, we offer little more than the palliative care of self-delusion. We tell ourselves and others that we can solve even the toughest problems, but we are like the shaman who holds a dying patient's hand and says, "Don't be alarmed. I can heal you." The patient is eager to believe the lie, and so is the shaman, but the patient is dead in the morning all the same.

It seems clear, then, that a good case can be made for Skinner's thesis that what behavior science teaches us is that we cannot solve the problems that now threaten our species. Had we reached our current level of understanding of behavior a hundred years ago, our prospects might be brighter. But under present circumstances, even optimists must admit that our future is in doubt. In my conversation with Skinner, the only hope he held out was winning over a substantial number of influential people—educators, writers, journalists, scientists, and scholars—who might then pressure policy makers to take effective action. The fact that we are doing next to nothing to win them over is perhaps further support for Skinner's view.

And so the ultimate challenge is this: To prove that evolution has given us not only impulses that undermine our health; impel us toward violence; turn us into cheats, liars, and brigands; and threaten to make our world uninhabitable, but also the ability and the propensity to overcome those failings. Ironically, the ultimate challenge for behavior analysts is to prove B. F. Skinner wrong.

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